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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,901	12/27/2001	George Cintra	08935-249001 /M-4965	1584

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FISH & RICHARDSON PC
225 FRANKLIN ST
BOSTON, MA 02110

EXAMINER	
ALEJANDRO, RAYMOND	
ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/034,901	CINTRA ET AL.	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) *5-8,12,13 and 16-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9-11,14,15 and 34-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *05/10/04* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This communication is responsive to the amendment of 01/07/04. The applicants have overcome the objections. However, the 35 USC 102 rejection is herein maintained for the reasons of record. Hence, the present application is finally rejected.

Additionally, this submission addresses the restriction requirement of claims 34-45 based on election by original presentation as set forth in the prior office action dated 03/02/04. In this regard, it is noted that during a telephonic interview on 05/10/04 (refer to the interview summary for the substance of the interview) it was agreed to withdraw said restriction and to rejoin the foregoing claims for purpose of prosecution. Accordingly, claims 1-4, 9-11, 14-15 and 34-45 are being examined on the merits.

Election/Restrictions

1. As mentioned above, for purposes of prosecution, claims 34-45, previously withdrawn from consideration as a result of a restriction requirement, are now subject to being rejoined. Thus, claims 34-45 are hereby rejoined and fully examined for patentability. Since the foregoing claims previously withdrawn from consideration have been now rejoined, the restriction requirement made in the Office action mailed on 03/02/04 is hereby withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-4, 9-11 and 14-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Johnson 6402796.

The instant application is directed to a method of making a battery electrode wherein the disclosed inventive concept comprises forming a cathode layer and removing the substrate. Other limitations include the cathode mixture; the substrate material; the current collector; the binder and the continuous process.

As to claim 1:

Johnson discloses a method of producing a battery wherein the method commences with a substrate 11 upon which the layers of battery components are built upon; the substrate is then remove and replaced with a cathode current collector (Abstract/Col 3, lines 24-45). Johnson teaches that a cathode made of a lithium intercalation compound or lithium metal oxide LiM_xO_y where M is a metal and O denotes oxygen such as $LiCoO_2$ $LiMgO_2$ or $LiNiO_2$ or $LiFeO_2$ (COL 2, lines 9-15). *Thus, Johnson refers to mixed metal oxides which are compounds formally derived from an individual metal oxides but contain two or more metal species often in arbitrary ratio.*

Johnson discloses and claims the following (COL 1, lines 43-47/ CLAIMS 1 and 8):

In a preferred form of the invention a method of producing a method of producing a thin film battery cell comprises the steps of providing a supporting substrate, depositing a cathode upon the substrate, depositing an electrolyte upon the cathode, and removing the substrate from the cathode.

1. A method of producing a portion of a thin film battery cell comprising the steps of:
(a) providing a supporting substrate;
(b) depositing a cathode upon the substrate;
(c) depositing an electrolyte upon the cathode; and
(d) removing the substrate from the cathode.

8. A method of producing a portion of a thin film battery cell comprising the steps of:
(a) providing a substrate made of a sputterable material;
(b) depositing a cathode upon the substrate; and
(c) sputtering the substrate so as to substantially remove the substrate from the cathode.

Examiner's note: *the instant claims fail to further specify whether the term "cathode mixture" stands for a physical mixture wherein the substances are mixed but not chemically combined and may be separated mechanically. Consequently, the present claim language has been construed as encompassing either: i) a physical mixture, or ii) a cathode mixture comprising any mixed metal oxides representing compounds which are formally derived from individual slurry metal oxides but contain two or more metal species often in arbitrary ratio, are chemical reaction products generally formed by heating mixture of appropriate oxides and are not physical mixtures but are true examples of chemical mixtures i.e. chemical compounds of arbitrary ratio.*

As to claim 2:

It is disclosed that the cathode sputtering device has a $LiCoO_2$ target or other suitable litigated metal oxide target that is energized so that battery cathodes are deposited upon the substrate (COL 3, lines 38-42). *Thus, the lithiated metal oxide compound is the active material mixture of matter acting as the slurry.*

As to claims 3-4:

Johnson disclose that the substrate can be either a metal or polymeric material (COL 3, lines 24-25/COL 5, lines 25-28):

> compounds. It should also be understood that other materials may be utilized for the web substrate such as nickel, copper, nickel-copper compounds, other metals and some polymers, such as polyethylene. Furthermore, it should also be under-

As to claims 9-10:

It is disclosed that as the web continues about the aligning drum 62 the web passes below the cathode current collector mask 68 and adjacent the cathode current collector sputtering device, so that the cathode current collector device 67 deposits a very thin cathode current collector 18 thereon (COL 4, lines 54-62). It is further discloses that the web may be wound upon the aligning drum 62 in such a manner so that complete battery cells are stacked in alignment one upon the other (COL 4, lines 63-67). *Thus, the layers are stacked one upon another, at least, under certain degree of pressure.*

As to claim 11:

It is disclosed that the a protective coating may then be deposited upon the current collector to allow later stacking of the battery (COL 4, lines 35-39). *Thus, the protective coating assists to bind together the stackable components.*

As to claims 14-15:

Johnson teaches that the process of depositing cathode materials continues until substantially the entire substrate web is coated (COL 3, lines 43-46). Johnson further discloses that the process is continuously carried out (COL 3, lines 46 to COL 4, lines 62). *Thus, the steps of forming the layer and removing the substrate are continuous.*

Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 34-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson 6402796 as applied to claims 1 above, and further in view of Hamamoto et al 2002/0168576.

Johnson discloses a method of making a battery electrode according to the foregoing aspects. However, the preceding reference does not expressly disclose the specific cathode mixture components.

As to claims 34-45:

Hamamoto et al disclose that cathode can be prepared by mixing the cathode active material with a conducting agent, a binder such as polyvinylidene fluoride (PVDF), polytetrafluoroethylene (PTFE), and N-methylpyrrolidone solvent to form a cathode paste which

is coated on a collector (*the substrate*) (SECTION 0043, 0044, 0062). **EXAMPLE 1** exemplifies mixing such specific electrode components to form the cathode paste (EXAMPLE 1).

[0043] The cathode can be prepared by mixing the cathode active material with a conductive agent such as acetylene black or carbon black, a binder such as polyvinylidene fluoride (PVDF), polytetrafluoroethylene (PTFE), and N-methylpyrrolidone solvent to form a cathode paste, then coating this cathode paste on a collector such as aluminum foil or a stainless steel lath, drying at 50 to 250° C., followed by compression molding.

[0062] 80% by weight of $LiCoO_2$ (cathode active material), 10% by weight of acetylene black (conductive agent), and 10% by weight of polyvinylidene fluoride (binder) were mixed and diluted by N-methylpyrrolidone to prepare a cathode paste. The paste was coated on an aluminum foil

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to employ the specific cathode mixture components of Hamamoto et al to make the battery electrode of Johnson because Hamamoto et al teach that battery cathodes can be prepared by mixing together the cathode active material, conducting aids, solvents and binders. Accordingly, such specific cathode mixture materials are suitable battery electrode components helping to provide a non-aqueous electrolyte battery having satisfactory electric capacity and superior cycle characteristics and storage characteristics.

Response to Arguments

Applicant's arguments filed 01/07/04 have been fully considered but they are not persuasive. The sole and principal line of argument presented by applicants is that the prior art fails to "disclose or suggest forming a layer including a cathode mixture as claimed".

Nevertheless, this is respectfully disagreed with. In this respect, it is noted that the prior art clearly teaches the use of specific lithium intercalation compounds or lithium metal oxides as cathode active materials. Incidentally, it is recorded that by definition a compound is something formed by a union of elements or materials, or a material composed of or resulting from union of separate elements or ingredients, namely, a compound is a substance formed by chemical union of two (2) or more ingredients in definite proportion by weight. Thus, having shown the prior art, indeed, discloses the use of lithium intercalation compounds or lithium metal oxides as cathode active material, it is therefore contended that the prior art's cathode material, to some extent, stand for a mixture comprising portions of matter consisting of two (2) or more components in varying proportions. Consequently, those of ordinary skill in the art would clearly recognize that the cathode material of cited reference reads on the broad cathode mixture of the claimed invention because, at least, lithium metal oxides are composites containing more than two different constituents. Succinctly stated, the reasonable broadest interpretation of a mixture does encompass the combination or union of more than one (1) materials or ingredients wherein either each material or ingredient retain its own property, or wherein a distinct substance is formed by chemical union of more than one (1) ingredient as well.

Thus, the instant claims fail to further specify whether the term "cathode mixture" stands for a physical mixture wherein the substances are mixed but not chemically combined and may be separated mechanically. Consequently, the present claim language has been construed as encompassing either: i) a physical mixture, or ii) a cathode mixture comprising any mixed metal oxides representing compounds which are formally derived from individual slurry metal oxides but contain two or more metal species often in arbitrary ratio, are chemical reaction products

generally formed by heating mixture of appropriate oxides and are not physical mixtures but are true examples of chemical mixtures i.e. chemical compounds of arbitrary ratio.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

8. In addition, applicant's amendment necessitated the new ground(s) of rejection presented in this Office action for claims 34-45. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Examiner
Art Unit 1745